

A CHECKLIST OF THE VASCULAR PLANTS OF HUBBELL TRADING POST
NATIONAL HISTORIC SITE, GANADO, ARIZONA

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ABSTRACT

Based on a survey of the vascular vegetation found in the Hubbell Trading Post, a national historic site, 130 species and varieties are listed, which may serve as a base line study. One species is a new state record for Arizona, and 19 species are new records for Apache County.

The "Hubbell Trading Post", a national historical site on the Navajo Indian Reservation (ca. 1.5 km west of Ganado, Apache County, Northeast Arizona), was founded by John Lorenzo Hubbell, a century ago. Reservation trading posts not only served for trade between the native and non-native Americans but also as a bridge between cultures until the early part of 20th century. Since the middle of 20th century, many such trading posts have been closed. Most of the surviving trading posts in order to compete with the modern conveniences of chain stores have become self-service. However, Hubbell Trading Post has changed little since its establishment, and continues to be a place for the sale of native American handicrafts, in particular colorful handwoven rugs and silver jewelry. Presently, this active trading post is administered by the National Park Service.

At the request of the Park Service, the vascular vegetation (native, introduced but naturalized, and cultivated) of this site was surveyed between June 20 and July 12, 1986. The primary purpose of this survey was to record all the woody vegetation on the site. Such a documentation might be useful in future restoration of existing woody species on this historical site. This list excludes cultivated species.

The historical site (ca. 65 ha) is part of the Defiance Plateau, with an elevation of ca. 1900 m. The extreme northern part includes Pueblo Colorado Wash and "Hubbell Hill." The soils of this site have been derived from Moenkopian sandstones and are generally low in humus content and nitrogen (Kearney and Peebles 1964). Wind erosion is insignificant compared to the rest of the Navajo Reservation. The relative humidity is low because of the low precipitation (ca. 30 cm per year). The average high temperature in July is ca. 32 C while the average low temperature in January is ca. -11 C.

The vegetation of this area is classified as "Great Basin Microphyll Desert" (Kearney and Peebles 1964). Salt tolerant shrubs such as rabbitbrush (Chrysothamnus nauseosus), snakeweed (Gutierrezia

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sarothrae), fourwing saltbush (Atriplex canescens), and shadescale (A. confertifolia) are important dominants. The ground cover mainly consists of field-bindweed (Convolvulus arvensis). Members of Asteraceae (29 species), Boraginaceae (3 species), Brassicaceae (10 species), Fabaceae (9 species), and Malvaceae (4 species) are commonly seen. Russian olive (Elaeagnus angustifolia), cottonwood (Populus fremontii), and salt cedar (Tamarix chinensis) are dominant along the Pueblo Colorado Wash. On the sand bed, prostrate pigweed (Amaranthus graecizans), sand verbena (Tripterocalyx carnea var. woottonii), spectaclepod (Dimorphocarpa wislizenii), showy primrose (Oenothera speciosa), and Nama retrosum are frequently found. Buttercups (Ranunculus cymbalaria var. saximontanus), common plantain (Plantago major), and sedges (Scirpus americanus) are commonly associated in the marshes. On the Hubbell Hill, desert plume (Stanleya pinnata) and twinpod (Physaria chambersii) are common along the slopes, and big sagebrush (Artemisia tridentata), jointfir (Ephedra torreyana), and Menodora scabra are abundant at the hilltop. Federal regulations prohibit domestic livestock grazing on this site. Hence, on disturbed sites, alfalfa (Medicago sativa), white sweetclover (Melilotus alba), and yellow sweetclover (M. officinalis) are common. Succulents such as prickly pears (Opuntia spp.) and Spanish bayonet (Yucca angustissima) are uncommon.

The seed plants of Apache County are covered in "Seed Plants of Northern Arizona" (McDougall 1973) and "Arizona Flora" (Kearney and Peebles 1960). Several taxa have been added and nomenclatural corrections made in "A Catalogue of the Flora of Arizona" (Lehr 1978) and subsequent supplements (Lehr and Pinkava 1980, 1982).

The arrangement of groups of vascular plants are in the order of Pteridophytes, Gymnosperms, and Angiosperms (monocotyledons, and dicotyledons); the families, genera, and species in each group are arranged alphabetically. This catalogue, which may serve as a base line study lists 131 species, subspecies, and varieties belonging to 112 genera and 42 families. Nineteen species are listed as new records for Apache County (the names of taxa that were not recorded by McDougall 1973) and are preceded by a single asterisk mark (*) in the list. One species, Alyssum minus was found to be a new state record for Arizona (taxon that was not included by Lehr 1978, and Lehr and Pinkava 1980, 1982), and this name is preceded by double asterisk marks (**). Dudley (1968) reported Alyssum minus in California, Colorado, and Utah, while Martin and Hutchins (1980) do not include this species for New Mexico. The voucher specimens for this study have been deposited in the S. M. Tracy Herbarium (TAES) and at Hubbell Trading Post.

PTERIDOPHYTES

Equisetaceae

Equisetum arvense L.

Horsetail

GYMNOSPERMS

Cupressaceae

Juniperus monosperma (Engelm.) Sarg. Oneseeded juniper

Ephedraceae

Ephedra torreyana S. Wats. Jointfir

Pinaceae

Pinus edulis Engelm. Pinyon pine

ANGIOSPERMS

Monocotyledons

Cyperaceae

Scirpus americanus Pers. Bulrush

Juncaceae

*Juncus xiphioides E. Mey. Three-square bulrush

Liliaceae

Calochortus nuttallii Torr. & Gray Segolily
Yucca angustissima Engelm. Spanish bayonet

Poaceae

*Agrostis stolonifera L. Red three-awn
Aristida longiseta Steud. Japanese brome
Bromus japonicus Thurb. Downy brome
Bromus tectorum L. Orchard grass
Dactylis glomerata L. Orchard grass
Elymus trachycaulus (Link) Shinners (Agropyron trachycaulum (Link) Malte). Slender wheatgrass
Elytrigia smithii (Rydb.) Nevski (Agropyron smithii Rydb., Elymus smithii (Rydb.) Gould). Western wheatgrass
Hordeum jubatum L. Foxtail barley
Hordeum leporinum Link Hare barley
Oryzopsis hymenoides (Roem. & Schult.) Ricker Indian ricegrass
Poa fendleriana (Steud.) Vasey Mutton grass
Polypogon monspeliensis (L.) Desf. Rabbitfoot grass
*Puccinella distans (L.) Parl. Weeping alkaligrass
Sporobolus airoides (Torr.) Torr. Alkali sacaton
Stipa columbiana Macoun Columbia needle grass
Triticum cylindricum (Host) Ces. (Aegilops cylindrica Host) Jointed goatgrass

Dicotyledons

Amaranthaceae

- Amaranthus graecizans L. (A. blitoides S. Wats.) Prostrate pigweed
Amaranthus wrightii S. Wats.

Apiaceae

- Cymopterus purpureus S. Wats.

Asclepiadaceae

- Asclepias subverticillata (Gray) Vail. Whorled milkweed

Asteraceae

- Achillea millifolium L. (A. lanulosa Nutt.) Yarrow
Ambrosia sp.
Artemisia tridentata Nutt. Big sagebrush
Carduus nutans L. Musk thistle
Chrysothamnus nauseosus (Pursh) Britt. var. graveolens (Nutt.) Piper Rubber rabbitbrush
Cirsium ochrocentrum Gray Yellowspine thistle
*Cirsium vulgare (Savi) Tenore Bull thistle
Cirsium sp.
Coryza canadensis (L.) Cronq. Horseweed
Erigeron divergens Torr. & Gray Spreading fleabane
Grindelia aphanactis Rydb. Gumweed
Gutierrezia sarothrae (Pursh) Britt. & Rusby Broom snakeweed
Helianthus ciliaris DC. Blueweed
Helianthus petiolaris Nutt. Prairie sunflower
Heterotheca villosa (Pursh) Shinners (Chrysopsis villosa (Pursh) Nutt.) Hairy golden aster
Hymenopappus filifolius Hook. var. lugens (Greene) Jeps.
Hymenopappus filifolius Hook. var. pauciflorus (I. Johnst.) Turner
Hymenoxys richardsonii (Hook.) Cockl. var. floribunda (Gray) Parker. Pinque
*Iva axillaris Pursh Poverty weed
*Lactuca serriola L. Prickly lettuce
Leucelene ericoides (Torr.) Greene (Aster arenosus (Heller) Blake)
Machaeranthera linearis Greene (Aster cichoriaceus (Greene) Blake)
Malacothrix fendleri Gray
Senecio douglasii DC. var. longilobus (Benth.) Benson Threadleaf groundsel
Taraxacum officinale Weber Common dandelion
Thelesperma megapotamicum (Spreng.) O. Ktze. Green thread
Tragopogon dubius Scop. Goatsbeard
Xanthium strumarium L. Cocklebur
*Xylorhiza tortifolia (Torr. & Gray) Greene (Aster abatus Blake; (Machaeranthera tortifolia (Gray) Cronq. & Keck) Desert aster

Boraginaceae

- Cryptantha barbiger (Gray) Greene Bearded cryptantha
Cryptantha jamesii (Torr.) Payson
Lappula redowskii (Hornem.) Greene var. cupulata (Gray) Jones

Brassicaceae

- *Alyssum minus (L.) Rothmal.
 *Camelina microcarpa Andr. ex DC. Littlepod
Capsella bursa-pastoris (L.) Medic. Shepherds purse
Dimorphocarpa wislizenii (Engelm.) Rollins
 (Dithyrea wislizenii Engelm.) Spectaclepod
Lepidium perfoliatum L. Shieldcross
Lesquerella intermedia (Wats.) Heller. Bladderpod
 *Physaria chambersii Rollins Twinpod
Sisymbrium altissimum L. Tumble mustard
Stanleya pinnata (Pursh) Britt. Princes plume
Streptanthus cordatus Nutt. ex Torr. & Gray Twist flower

Cactaceae

- *Opuntia violacea Engelm. var. macrocentra (Engelm.) Benson Black-spined pricklypear
Opuntia whipplei Engelm. & Bigel. Whipple cholla

Capparidaceae

- Cleome serrulata Pursh Spiderflower

Chenopodiaceae

- Atriplex canescens (Pursh) Nutt. Four-wing saltbush
Atriplex confertifolia (Torr. & Frem.) S. Wats. Shadscale
Chenopodium album L. Common lambs-quarters
 *Kochia scoparia (L.) Schrad. var. subvillosa Moq. Summer cypress
Salsola iberica Senn. & Pau (S. kali var. tenuifolia Tausch,
S. pestifer A. Nels.) Russian thistle, Tumbleweed

Convolvulaceae

- Convolvulus arvensis L. Field bindweed

Elaeagnaceae

- Elaeagnus angustifolia L. Russian olive

Euphorbiaceae

- Croton texensis (Klotz.) Muell. Arg. Doveweed
Euphorbia fendleri Torr. & Gray Fendler spurge
Euphorbia glyptosperma Engelm. Rib-seeded sandmat
 *Euphorbia maculata L. (E. supina Raf.)

Fabaceae

- *Astragalus castaneiformis S. Wats.
Lupinus kingii S. Wats. Kings lupine
Medicago lupulina L. Black medic
Medicago sativa L. Alfalfa
Melilotus alba Medic. White sweetclover
Melilotus officinalis (L.) Lam. Yellow sweetclover
Oxytropis lambertii Pursh Lambert locoweed
Parryella filifolia Torr. & Gray ex Gray
Trifolium repens L. White clover

Geraniaceae

- Erodium cicutarium (L.) L'Her. ex Soland. Alfilaria, Filaree

Hydrophyllaceae

- *Nama retrorsum J.T. Howell

Lamiaceae

- Dracocephalum parviflorum Nutt. (Moldavica parviflora (Nutt.) Britt.) Dragon head
Marrubium vulgare L. Horehound
Mentha arvensis L. var. villosa (Benth.) Stewart.

Linaceae

- Linum aristatum Engelm. Flax

Loasaceae

- Mentzelia pumila (Nutt.) Torr. & Gray Blazing star, Stick leaf

Malvaceae

- Malva neglecta Wallr. Common mallow
 *Sphaeralcea ambigua Gray
Sphaeralcea coccinea (Nutt.) Rydb. Scarlet globe-mallow
Sphaeralcea fendleri Gray Fendler mallow

Nyctaginaceae

- Mirabilis linearis (Pursh) Heimerl. (Oxybaphus linearis (Pursh) Robins.)
Mirabilis multiflora (Torr.) Gray Colorado four-o'clock
Tripterocalyx carnea (Greene) Galloway var. wootonii (Standl.) Galloway
 (T. wootonii Standl.) Sand verbena

Oleaceae

- Menodora scabra Gray

Onagraceae

- Gaura parviflora Dougl. ex Lehm. Lizardtail
 *Oenothera caespitosa Nutt. var. jonesii Munz. Primrose
 *Oenothera speciosa Nutt. Showy primrose

Papaveraceae

- Argemone munita Dur. & Hilg. Prickly poppy

Plantaginaceae

- Plantago major L. Common plantain
Plantago patagonica Jacq. var. gnaphaloides (Nutt.) Gray (P. purshii
 Roem. & Schult.)

Polemoniaceae

- Gilia subnuda Torr. ex Gray

Polygonaceae

- Eriogonum cernuum Nutt. Wild buckwheat, Nodding eriogonum
Polygonum aviculare L. Prostrate knotweed
 *Polygonum lapathifolium L. Willow smartweed
Rumex mexicanus Meisn. Dockweed

Portulacaceae

- Portulaca oleracea L. Common purslane

Ranunculaceae

- Ranunculus cymbalaria Pursh ssp. saximontanus (Fern.) Thorne
 Buttercup, Crowfoot

Salicaceae

- Populus fremontii S. Wats. Fremont cottonwood
Salix exigua Nutt. Coyote willow

Scrophulariaceae

- Castilleja linariifolia Benth. Indian paintbrush
Veronica americana Schwein. ex Benth. Speedwell

Solanaceae

- Chamaesaracha coronopus (Dunal) Gray Small groundcherry
Lycium pallidum Miers Wolfberry
 *Physalis virginiana Mill. var. sonorae (Torr.) Waterfall (P. lanceolata
 Michx., P. longifolia Nutt.) Longleaf groundcherry
Solanum rostratum Dunal Buffalobur

Tamaricaceae

Tamarix chinensis Lour. (T. pentandra sensu K. & P.) Salt cedar

Verbenaceae

Verbena bracteata Lag. & Rodr. Prostrate vervain

Zygophyllaceae

Tribulus terrestris L. Puncture vine, Cadillo

LITERATURE CITED

- Bailey, L. H. 1949. Manual of cultivated plants. The MacMillan Company, New York.
- Dudley, T. R. 1968. Alyssum (Cruciferae) introduced in North America. Rhodora 70:298-300.
- Kearney, T. H. and R. H. Peebles. 1960. Arizona flora, ed. 2, with supplements. University of California Press, Berkeley, CA.
- Lehr, J. H. 1978. A catalogue of the flora of Arizona. Desert Botanical Garden, Phoenix, AZ.
- Lehr, J. H. and D. J. Pinkava. 1980. A catalogue of the flora of Arizona. Supplement I. J. Arizona-Nevada Acad. Sci. 15:17-32.
- _____ and _____. 1982. A catalogue of the flora of Arizona. Supplement II. Arizona-Nevada Acad. Sci. 17:19-26.
- Martin, W. C. and C. R. Hutchins. 1980. Flora of New Mexico, 2 vols. Strauss and Cramer GmbH, 6945 Hirschberg 2, Germany.
- McDougall, W. B. 1973. Seed plants of Northern Arizona. The Museum of Northern Arizona, Flagstaff, AZ.